

the moist air within it is cooled sufficiently to make water condense on any ions which may be present, no appreciable stirring of the air resulting from the expansion. Ionising particles passing through the air leave visible trails, consisting of cloud particles condensed on the ions.

CHEMISTRY.—*Sir W. Crookes, O.M.*: Properties of pure fused boron, and the volatility of metals of the platinum group. Pure fused boron, prepared by Dr. Weintraub by decomposing a volatile boron compound in the electric arc, is deposited on water-cooled copper electrodes. The agglomerated boron condenses in a crystalline form. Pure boron can be fused in a mercury arc furnace. It is very hard, and easily scratches quartz and corundum. The most remarkable property of pure fused boron is the abnormal value of its temperature coefficient of resistance. Between ordinary room temperature and a dull red heat the resistance drops in the ratio of 2×10^6 to 1. A small piece of fused boron mounted in series with an electric lamp, at room temperature, obstructs nearly all the current. Warming the boron reduces the resistance, and the lamp lights. Platinum, in the form of very thin ribbon, heated for many hours to a temperature approaching its melting point, sublimes and deposits beautifully formed crystals on the surrounding vessel. Iridium is more volatile than platinum at a high temperature. A plate of pure iridium, after having been heated for twenty-two hours at 1300°C ., has a beautiful "moirée" surface. A crucible of iridium, showing signs of crumbling after long heating, was exhibited.

Messrs. Carl Zeiss (London), Ltd.: Apparatus for demonstrating liquid crystals with polarised light (projection on screen). This instrument consists of an automatic feeding arc lamp of 5 amperes, condensing lenses, water cooler, mounted on optical bench, a microscope, with specially wide body tube situated on the end of optical bench in upright position, and provided with a blow-pipe arrangement and air blast for the purpose of heating chemical preparations to a temperature up to 800°C . Analyser and objectives are provided with cooling chambers, and the object stage is arranged with electric terminals for passing a current across the stage. A specially constructed polariser is fitted below the object stage possessing a large aperture as compared with its length.

ENGINEERING.—*Mr. J. Dewrance*: An adhesion pump. A viscous fluid enters by gravity a shallow spiral channel cut on a revolving surface that is held against the smooth surface of a corresponding chamber. The fluid adheres to both surfaces, and progresses along the channel and is delivered at the other end at considerable pressure.

Prof. E. G. Coker: Special polariscope for examining engineering models under stress. The polariscope is constructed for examining long transparent models of engineering structures by circularly polarised light. Plane polarised light, obtained by reflection from a black glass plate, is afterwards circularly polarised by large quarter-wave plates of mica. The object under stress is viewed through an analyser constructed of glass sheets, and a model, 40 in. by 10 in., can be viewed at one time without the aid of Nicol's prisms.

Dr. J. G. Gray and Mr. G. Burnside: (1) Continuous-current motor-gyrostats for the demonstration of the properties and practical applications of the gyrostatis. The gyrostatis, which are motors of the Gramme Ring type, are provided with accessories for demonstrating the properties and practical applications of the gyrostatis. Experiments (both qualitative and quantitative) can be carried out with convenience and precision. (2) Walking and climbing gyrostatis.

Motor-gyrostatis are mounted in various ways within wooden boxes. By operating the gyrostatis by means of electromagnets, the boxes, which are provided with arms and legs, are caused to walk on the floor and to walk arm over arm along wires stretched horizontally.

NOTES.

At a meeting of the London Section of the Deutsche Kolonial-Gesellschaft on May 11, Dr. A. Smith Woodward gave an address on the significance of the recent discoveries of Cretaceous Dinosauria in German East Africa. Since 1909 excavations have been in progress in the Tendaguru Hills, under the immediate supervision of Prof. W. Janensch and Dr. E. Hennig, and an appeal is now being made for funds to proceed with a fourth year's work. In describing the results, so far as he had seen them in the Berlin Museum, Dr. Woodward emphasised the importance of an exhaustive comparison of the sauropodous dinosaurs of Africa with those of North America, which would now soon be possible. He also alluded to the problems suggested by the gigantic size of some species, which much exceeded the extreme limit of growth calculated to be possible by the late Prof. Marsh when he first discovered the femur of *Atlantosaurus*. Prof. W. Branca sent for exhibition to the meeting a plaster cast of the humerus of *Gigantosaurus*, 2.10 metres in length, which is shortly to be placed in the British Museum (Natural History); while Prof. Janensch lent an important series of photographs which he had taken at different stages during the excavations. The German society is to be congratulated on its enlightened interest in purely scientific work undertaken in a colonial possession, and English science will appreciate the compliment paid to one of its exponents by his being invited to deliver the address in question.

PROF. FRÜHLING, who died at Brunswick on April 24, at seventy-one years of age, did much towards enabling young men engaged in practical sugar work to obtain a scientific training. After graduating in 1866 with a thesis on the nitric acid contents of agricultural crops during the various periods of their growth, he started, in 1870, a public analytical laboratory, and two years later added a department at which instruction in sugar work was given. This "Schule für Zucker-Industrie zu Braunschweig" has flourished ever since, and been attended by students from practically every sugar-producing country in the world, among them being fourteen Englishmen. His "Anleitung," or methods of analysis for all products connected with the sugar industry, has been translated into several foreign languages; in 1911 it reached its seventh edition. He also published an "Anleitung," or laboratory guide, for soil analysis, and edited Stammer's pocket calendar for sugar manufacturers since 1894. The majority of sugar factories in the north of Germany retained him as their official analyst. He also invented several useful pieces of apparatus, which have been adopted for sugar work in a large number of Continental sugar laboratories.

PROF. POYNTING being unable to deliver his lectures at the Royal Institution on May 30 and June 6, the lectures on those dates will be given by Prof. C. G. Barkla, F.R.S., upon the subject of "X-rays and Matter."

THE final meeting of the British subcommittee of the Anton Dohrn Memorial Fund Committee was held on Wednesday, May 8, in the University of London. The hon. treasurer, Prof S. J. Hickson, presented the accounts, and stated that after all expenses had been paid there was a balance in hand amounting to 163*l.* 18*s.* 9*d.* It was resolved that the account of the British subcommittee be closed, and the balance forwarded to the treasurer of the International Committee.

A CORRESPONDENT of *The Times* states that last week the Italian naval and military authorities, who have been carrying out experiments in wireless telephony, established communication between Monte Mario and the wireless station of Becco di Vela, on Maddalena Island, a distance of about 160 miles. A long extract from a newspaper was read in Rome and heard and repeated at Maddalena. The voices were perfectly distinct, so much so that the listener in Sardinia detected immediately the substitution of a different speaker half-way through the message.

WE are officially informed that the post of Inspector-General of Agriculture in India has been combined with that of the director of the Agricultural Research Institute and principal of the Agricultural College, Pusa, under the designation of Agricultural Adviser to the Government of India and Director of the Agricultural Research Institute, Pusa. All communications, publications, &c., intended for either of the two offices should therefore be addressed to the Agricultural Adviser to the Government of India and Director of the Agricultural Research Institute, Pusa. The designation of the post of Assistant Inspector-General of Agriculture in India has also been altered to the Assistant to the Agricultural Adviser to the Government of India.

THE London Institution (Transfer) Bill—or, to give the full title, "A Bill to provide for the transfer to the Commissioners of Works of certain property of the London Institution for the purposes of a School of Oriental Studies, and for the dissolution of the Institution, and for purposes in connection therewith"—has now been circulated. It is proposed that the property and funds of the institution shall be transferred to the commissioners, and that certain books and manuscripts will be retained by the institution. There will be paid to the institution, in consideration for the vesting of the property in the commissioners, 12,000*l.* out of moneys provided by Parliament. The books and manuscripts retained by the institution are to be transferred to such public institutions as may be determined by the committee of management. The institution will eventually be dissolved, and the charter of the institution revoked. The sums of money to be paid to the proprietors of the institution to discharge their shares are specified in a schedule to the Bill.

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THE Colonial Office has issued a memorandum announcing that from July 1 the Sleeping Sickness Bureau will be known as the Tropical Diseases Bureau. The Sleeping Sickness Bureau had its origin in the International Conference on Sleeping Sickness held in London in 1907 and 1908, to concert measures for the control of that disease, which was spreading rapidly in tropical Africa. After its establishment it soon became evident that what the Bureau was doing for sleeping sickness could be done in the same way for tropical diseases generally. Lord Crewe, during his term of office as Secretary of State for the Colonies, and Mr. Lewis Harcourt have interested themselves in the expansion of the Bureau, and the arrangements are now completed. The expansion entails increased expenditure, and the annual available sum is now approximately 5000*l.* The Bureau, having outgrown the accommodation provided by the Royal Society, will have its quarters at the Imperial Institute. The new Bureau will deal with all exotic diseases which are prevalent in tropical and subtropical regions, and will publish at frequent intervals a *Tropical Diseases Bulletin*, which will take the place of the present *Sleeping Sickness Bulletin*. The director will have the help of an assistant director and a number of experts, who will be responsible for the different subjects, and will furnish authoritative reviews and summaries of published papers, to appear in the *Bulletin*. Thus the results of the most recent researches on every tropical disease in every country, new methods of treatment, improved means of prevention, will quickly become available for the remote worker in the tropics. The tropical diseases of animals will be treated in a separate publication.

MANY ethnologists are probably unaware of the important collections possessed by Marischal College, Aberdeen. These have now been rearranged and described in an admirable and well-illustrated catalogue, the work of the curator, Dr. R. W. Reid. At the present time, when proposals for the establishment of a folk museum are under consideration, it may be remarked that this class of objects is very fully represented at Aberdeen. Besides a fine collection of prehistoric objects, the museum is particularly rich in specimens of those domestic and rural implements and appliances which are rapidly passing into disuse and will soon be unprocurable. Thus there are numerous examples illustrating the arts of spinning and weaving, rude agricultural implements, household utensils, such as crusie lamps, the "puirman" for holding pine splinters used for illumination, and many others of equal interest. Of special importance is the marshal staff of Scotland, presented in 1760 by George, tenth and last Earl Marischal, great-great-grandson of George, fifth Earl Marischal, who founded the college in 1593.

THE Report of the Bacteriologist and Bulletins Nos. 8, 9, and 10 of the State Board of Agriculture, Michigan, dealing with various bacteriological subjects, which have been sent us, indicate how actively agricultural biology is being applied in the United States to the elucidation of practical problems, *e.g.* diseases of stock, the treatment of hog-cholera with a serum, soil and dairy bacteriology, and so on.

WE have received a report to the London School of Tropical Medicine on dysentery in Fiji during the year 1910, by Dr. P. H. Bahr, who was sent out specially to investigate the disease by funds generously provided by Lord Sheffield and Mr. E. W. Blessig. The disease in Fiji is of bacillary origin, and a number of varieties of the dysentery bacillus were isolated. Evidence is adduced that the housefly is the principal agent in its spread. Treatment with a polyvalent anti-dysentery serum seemed to give the best results. The report is a very valuable one, and is well illustrated.

EVER since 1857 British coleopterists have been on the look-out for *Claviger longicornis*, a species not uncommon in ants' nests on the Continent. Certain beetles taken in Oxfordshire in 1906 prove, according to Mr. J. J. Walker, in the May *Entomologists' Monthly Magazine*, to belong to the missing species.

THE migratory British species of *Salmo*—in other words, salmon and trout—form the subject of a very fully illustrated article by Mr. Boulenger in *The Field* of May 4. Figures are given of the age-phases and the adults of the two sexes of both species at different seasons, and likewise of some of the supposed local species of the trout.

ACCORDING to the third part of the *Bergens Museum Aarbok* for 1911, Norway experienced fourteen shocks of earthquake during 1910. The most severe was that of July 26, which was felt from Gildeskaal to Mo in Rauen. Four occurred in the earthquake district in Nordre Bergenhus Amt, on the west coast, another four in the disturbed district between southern Søndre Bergenhus Amt and Ryfylke in Stavanger Amt, two in the northernmost seismic area, and the remainder, which were all local, in districts usually free from disturbance.

IN *The Field* of May 4 is recorded the birth of an Indian elephant calf at Copenhagen on April 6th, this being the offspring of the same parents which produced a calf in 1907. It is the third recorded instance of such an event in Europe. In the case of the first Copenhagen calf the gestation period was twenty-three and in the second twenty-one months. Both calves showed black bristles on the back, but not apparently the coat of fine hair which was present in the calf born in London in 1903, the skin of which is mounted in the Natural History Museum.

DR. MARK JANSEN has published, in a brochure entitled "Achondroplasia: its Nature and its Cause" (Leyden: E. J. Brill, Ltd., 1912), the results of his studies on the phenomena exhibited by human dwarfs. He suggests that these phenomena may be due in part to abnormally high amnion pressure during certain stages of development, which may disturb the nutrition and growth of part of the foetus without interfering with the normal development of other parts of the body. He also discusses the influence of the pituitary body and the phenomena of acromegaly.

THE April number of the *Quarterly Journal of Microscopical Science* (vol. lvii., part iv.) contains important additions to our knowledge of two of the smallest and at the same time most interesting groups

of the animal kingdom. Mr. E. S. Goodrich gives a full account of the anatomy of the worm *Nerilla antennata*, hitherto regarded as a small Polychæte, and shows that it is really an Archiannelid. It occupies a central position amongst the somewhat heterogeneous members of that group, which it thus serves to bind together, and at the same time it in some measure bridges over the gap which separates the Archiannelida from the more highly organised Polychæta. Mr. C. L. Boulenger describes a new species of fresh-water medusa, *Limnocyclus rhodesiae*, from Rhodesia. This form, which is very closely related to the well-known *Limnocyclus tanganicae*, of Lake Tanganyika, was discovered by Mr. R. H. Thomas, in a tributary of the Hunyani River, which itself flows into the Middle Zambesi.

AN important contribution towards a complete flora of the Chinese Empire has been published in the *Kew Bulletin*, Additional Series, No. 10, by E. T. Dunn and W. J. Tutcher, the former and present superintendents of the Botanical and Forestry Department at Hongkong. This consists of an account of the flowering plants, ferns, and fern-allies of Kwangtung, the southernmost province of China, and of Hongkong itself. The short introduction to the flora deals with the climate, geology, and ecology of the area. This is followed by a key to the natural orders, which is skilfully worked out, and will prove of great use to students of general systematic botany apart from its special purpose—that of enabling collectors in China to determine their plants. Keys are also given to the genera of each order and to the species of each genus, and the bulk of the work is occupied by an enumeration of the species. The price of this *Flora*, which contains 370 pages, is 4s. 6d.

DR. C. E. Moss, curator of the Cambridge University Herbarium, who some time ago published a critical account of the British oaks, has just contributed to *The Gardeners' Chronicle* (Nos. 3718-3720) a much-needed revision of the British elms. After a critical discussion of the various species, varieties, and hybrids of the genus as represented in Britain, the author gives a concise key and conspectus of these forms. Of the five species noted, the Wych Elm (*Ulmus glabra*), the Smooth-leaved Elm (*U. nitens*), and the Small-leaved Elm (*U. sativa*) are regarded as being indigenous, while the English Elm (*U. campestris*) and the Cornish Elm (*U. stricta*) are not indigenous. Of the two *U. glabra* × *U. nitens* hybrids, the Dutch Elm (× *hollandica*) and the Huntingdon Elm (× *vegeta*), the former appears to be native in some localities. The Jersey Elm is described as a new variety (*U. stricta*, var. *sarniensis*, Moss). The articles are illustrated by photographs of herbarium specimens, and will undoubtedly be of great assistance to field botanists in the determination of the British elms, which have for so long remained in almost hopeless confusion.

WE have received, by the courtesy of the director, an advance copy of No. 1 of the new issue of the *Bulletin of the Imperial Institute*, the publication of which has been undertaken by Mr. John Murray. The

great activity in tropical planting enterprise in recent years has resulted in a large demand for this quarterly bulletin, which is now considerably enlarged, and will be the means of publishing the results of investigations of new raw materials from the Colonies and India carried out at the institute, and recent information regarding developments in tropical agriculture generally. This number (vol. x., No. 1) contains a concise introductory article on the history and activities of the institute, followed by articles dealing with the rubber resources of Uganda, the cultivation of cotton in Nyasaland and Uganda, the large deposits of diatom earth in East Africa, hemp and hemp seed, cultivation and preparation of ginger, and the first part of a long and detailed account of the coconut and its commercial uses—to mention only a few of the interesting papers in this issue of nearly 190 pages. A large number of reports on investigations of new Colonial products are included, and a special section of the bulletin is devoted to giving an account of recent developments of tropical agriculture throughout the world.

THE pupils of Ferdinand von Richthofen have agreed to publish annually a collection of geographical memoirs under the title of "Mitteilungen des Ferdinand von Richthofen-tages," to commemorate their master, who passed away in 1905. The first part, issued by Teubner, of Leipzig, for 1911, appropriately contains three papers on China, that by M. Groll dealing with the progress that can now be made in the production of a general map of the country. The greatest difficulty still lies in the absence of details as to the relief. It seems unfortunate that these papers cannot be published as special contributions to one of the recognised geographical journals.

FROM the issue of December last of the *Monthly Weather Review* of the Department of Marine and Fisheries, Canada, some interesting details are given of the highest and lowest temperatures in each province of Canada during that month. The highest temperature recorded was 65° at Alix, Alberta, on December 3, and the lowest was -59° on December 28, at Fort William, in the same province. Other low temperatures recorded during the month were -51° at the Pas, Saskatchewan, on December 29, -50° at Swan River, Manitoba, on the same day, when -40° was recorded at Fort St. James, British Columbia.

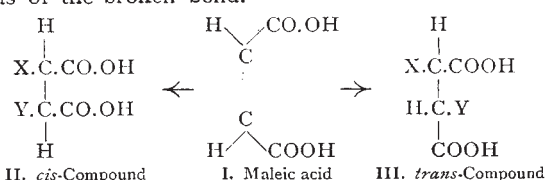
THE separately issued appendix No. 3 to the report for 1911 of the U.S. Coast and Geodetic Survey gives particulars of the magnetic observations made during the year ending at midsummer, 1911. Of the 351 land stations occupied during the year, seventy-one were old or "repeat" stations, and particulars are given of the values derived for the secular change of declination at these. Table I. summarises the results of the observations at the land stations, including nearly sixty stations along the Alaskan boundary, seven in Hawaii and one in British Columbia. Table II. gives particulars of observations made at sea, in both the Atlantic and Pacific Oceans, by three vessels attached to the Survey. The last fifty-nine

pages are occupied with a description of the land stations and their exact positions.

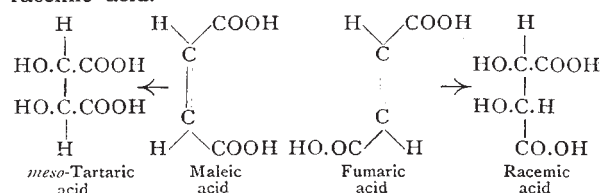
THE March number of the Journal of the Institution of Electrical Engineers contains a summary of the theory of the production of electric oscillations by Mr. A. S. M. Sorensen. After two short paragraphs dealing with oscillations in a single circuit having capacity and inductance, and in coupled circuits, he points out that in actual practice the capacities and inductances are not concentrated at particular points of the circuits nor are resistances and damping constant. In the case of an arc in circuit he shows how by the aid of the "characteristic curve" of the arc the main features of the oscillations produced in the three most important cases can be traced without the necessity of appeal to the differential equation of the circuit.

A YEAR ago Dr. K. Fredenhagen, of the University of Leipzig, described in the *Physikalische Zeitschrift* some measurements he had made of the currents produced by the electrons emitted by metals at high temperatures. At the time he believed his results were free from secondary effects, but more recent work on the alkali metals distilled and tested in high vacua has, according to a short communication to the German Physical Society published in the *Verhandlungen* for April 15, convinced him that the whole of the current observed in such cases may be due to the reactions taking place between the metal and the trace of gas still present even in the highest vacua. Since the velocities of such reactions would follow exponential laws as the temperature increased, the currents obtained would be expressed by Prof. Richardson's formula.

In his presidential address to the Chemical Society, reprinted in the April number of the Journal, Prof. Frankland has directed attention to the extreme frequency with which the rupture of a "double bond" is accompanied by "trans-substitution." It has usually been thought that the addition of a substance XY to a compound such as maleic acid must result in the production of the *cis*-compound II., in which the radicals X and Y occupy the same positions as the ends of the broken bond.



This view was confirmed by the oxidation of maleic acid to *meso*-tartaric acid and of fumaric acid to racemic acid.



But, so far from being the rule, the *cis*-substitution shown above appears to be entirely exceptional, since

it rarely (if ever) occurs except in the special case of oxidation. These facts are of considerable importance, as they throw doubt on the assumption, which is almost universally made, that a substituent group normally enters the same position as the atom or linkage which it displaces.

THE seventy-eighth annual report of the Natural History, Literary, and Polytechnic Society of Bootham School, York, for 1912, is noteworthy as providing evidence of the enthusiasm for scientific work which can be developed among schoolboys when qualified masters of a boarding-school are willing to devote part of their leisure hours to what is nearly always entirely a labour of love. The Natural History Society has some eleven sections, each devoted to a separate science, and excellent practical work was done in them all during the year under review.

A CONVENIENT card for hanging in offices, entitled "Standard Metric Equivalent Tables, comprising Weights, Measures, and Prices in Francs and Marks," has been published by the Central Translations Institute, Eastcheap, London. The equivalent prices in francs and marks per foot, yard, square yard, cubic foot, gallon, and similar British units will be very handy for merchants. The price of the card is 1s. 2d. post free.

A NEW and cheaper edition of "The Grouse in Health and in Disease" is in the press, and will be published in July next by Messrs. Smith, Elder and Co. In the absence of Dr. E. A. Wilson in the Antarctic, the book has been edited by Mr. A. S. Leslie and Dr. E. A. Shipley, and Lord Lovat has contributed an introduction.

OUR ASTRONOMICAL COLUMN.

REPORTED DISCOVERY OF A NEW COMET.—We learn, from *The Daily Mail* of May 14, that the following telegram has been received at the Greenwich Observatory:—"A comet-like object with a tail has been observed by Mr. Hansen at Praestoe, Denmark. It is of intense magnitude, and its position, given on May 10 at two o'clock, was R.A. 20h. 53m. 20s.; decl. $31^{\circ} 24' N.$ "

Probably the first statement of the second sentence should read, "It is of the *tenth* magnitude," for we are told that it is not visible to the naked eye. The position given lies about half-way between ζ and ϵ Cygni, and is on the meridian at about 5 a.m.; that is to say, it is above our horizon during all the hours of darkness.

The origin of the above telegram is not stated, and, so far, we have received no intimation of the discovery from the Kiel Centralstelle.

THE ROTATION OF URANUS.—When the axis about which a planet revolves makes a considerable angle with the observer's line of sight, the rotational motion can be detected, or even measured, spectroscopically, because as the planet rotates some regions of its limb must be travelling towards the observer, while others are travelling away from him. At the present epoch the orientation of Uranus is favourable to such an investigation, and spectrograms giving a measure of the planet's rotational velocity, secured at the Lowell Observatory, were exhibited and explained by Prof.

Lowell at the recent meeting of the Royal Astronomical Society. On these spectrograms the lines are inclined because the slit was so placed that at the top was the approaching limb, while at the bottom was the receding limb. Thus, in accordance with Doppler's principle, the extremities of the lines were displaced towards the violet and the red respectively, that is to say, they are inclined to the normal lines of the comparison spectrum photographed on the same plate. Measures of the inclination of a number of these lines, on different photographs, indicate that the planet makes one complete rotation in about 10h. 45m.

THE RECENT SOLAR ECLIPSE.—A large number of communications describing the observations made during the solar eclipse of April 17 are published in No. 4571 of the *Astronomische Nachrichten*.

Observations of the bright-line spectrum were made by Drs. Eberhard and Ludendorff at Berlin, and, like Prof. Fowler at South Kensington, and Prof. Iñiguez, Prof. Eberhard found that he was able to study the bright lines for quite half an hour. Dr. Kempf found that the first and last contacts took place 0.4m. earlier than predicted by the *Berliner Jahrbuch*, while at Lemberg, Dr. Grabowski found they were, respectively, 0.3m. and 0.6m. earlier. Quite a number of observers remark on the unexpected darkness of the eclipse and its observed effect on various flowers (especially tulips), beasts, and birds.

M. Felix de Roy gives a very interesting account of the observations made by the mission organised by the Antwerp Astronomical Society, and located at Silenriex (Hainaut, Belgium), where a true annular eclipse was seen. The inner corona was seen by one observer only, and the chromosphere and prominences were looked for in vain. Among the observers of contacts at the Kiel Observatory was Prince Henry of Prussia.

THE ORIGINS OF THE BRIGHT LINES IN NOVAE SPECTRA.—At the meeting of the Royal Astronomical Society, reported in the current number of *The Observatory* (No. 448), a number of spectra of Nova Geminorum were exhibited on the screen and afterwards discussed. Prof. Fowler, after remarking on the unfavourable weather experienced at South Kensington, exhibited two small-dispersion spectra obtained on March 15 and 29 respectively, and stated that as regards the origins of the lines, those assigned by Sir Norman Lockyer to the lines observed in the spectrum of Nova Persei (1901) would probably serve. The bright lines appearing in novæ also appear in the chromosphere and solar prominences, and are mainly those of the enhanced iron spectrum. Prof. Newall also agreed that many of the bright lines may be identified as enhanced lines of iron.

Dr. R. H. Curtiss describes the early spectra secured at the Ann Arbor (Mich.) Observatory, in No. 3, vol. xxxv., of *The Astrophysical Journal*. Five photographs taken on March 13 show a continuous spectrum similar in general appearance to that of Altair, but differing in the positions of the lines. Few narrow dark lines were seen, and all the prominent lines of the F5 type, e.g. $\lambda 4481$ and $\lambda 4549$, appear to be absent. H δ , H γ , and H β are all strong lines and very complex, both absorption and emission being represented; lines at $\lambda 5016$, $\lambda 4922$, and $\lambda 4472$, and the H and K lines of calcium have similar characteristics, the sharp reversals in the latter indicating a velocity of $+5 \text{ km.} \pm 3 \text{ km.}$ On a photograph taken on March 22 many of the maxima of emission on March 13 were maxima of absorption, and *vice versa*, and no certain trace of the nebula lines was to be seen.